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I, JULIE BILLINGSLEY, TEAM LEADER EXAMINATION SUPPORT AND SALES hereby certify that annexed is a true copy of the Provisional specification in connection with Application No. 2002953592 for a patent by JOHN SPENCE NOMINEES PTY LTD as filed on 30 December 2002.



WITNESS my hand this
Fourteenth day of January 2004

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PROVISIONAL SPECIFICATION

Invention Title: "Apparatus and Method for Panel Construction"

The invention is described in the following statement:

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"Apparatus and Method for Panel Construction"**Field of the Invention**

The present invention relates to an apparatus and method for panel construction.

Disclosure of the Invention

- 5 In accordance with one aspect of the present invention there is provided an apparatus for panel construction comprising support means, first formwork members to extend between respective pairs of support means, second formwork members to extend between respective pairs of support means, said first formwork members and said second formwork members to surround an area
10 for casting a panel, and at least said first formwork members are vertically repositionable on said respective pairs of support means for casting a subsequent panel.

- In accordance with a second aspect of the present invention there is provided a method for panel construction comprising positioning first formwork members to
15 extend between a respective pair of support means, positioning second formwork members to extend between a respective pair of support means, surrounding an area for casting a panel with said first and second formwork members, pouring concrete into said area and allowing said concrete to set to form a panel, and vertically repositioning said first formwork members on said respective pair of
20 support means for casting a subsequent panel.

Preferably, said second formwork members are provided as shuttering sheets.

Brief Description of the Drawings

The present invention will now be described, by way of example, with reference to the accompanying drawings, in which:

- 25 Figure 1 is a first perspective view of a first embodiment of an apparatus for panel construction in accordance with a first aspect of the present invention;

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Figure 2 is a second perspective view of the apparatus shown in Figure 1;

Figure 3 is a front elevation view of a support of the apparatus shown in Figure 1 with the fins arranged for casting panels of a first thickness;

Figure 4 is a rear view of the support shown in Figure 3;

5 Figure 5 is a front elevation view of a support of the apparatus shown in Figure 1 with the fins arranged for casting panels of a second thickness;

Figure 6 is a side elevation view of an upright of the apparatus shown in Figure 1 being supported by a prop; and

Figure 7 is a partly exploded view of a support of the apparatus shown in Figure

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1.

Best Mode(s) for Carrying Out the Invention

In figures 1 and 2 there is shown an apparatus 1 for panel construction comprising supports 2, first formwork members 4 extending between a respective pair of supports 2, second formwork members provided as sheets of shuttering 6 extending between a respective pair of supports 2. The formwork members 4 and the shuttering 6 surround an area 8 for casting a panel 10a. The formwork members 4 are vertically repositionable on the supports 2 for casting subsequent panels 10b, 10c.

The apparatus 1 shown in figures 1 and 2 is arranged for construction of rectangular panels 10. The formwork members 4 form the longitudinal edges of the panels 10 whilst the shuttering 6 forms the ends of the panels 10.

Each support 2 comprises a pair of uprights 12a, 12b, a base plate 14, a top-piece 16 and two fins 18. Each fin 18 is mountable on a respective upright 12a, 12b. Each top-piece 16 comprises a cross-piece 20, a locating pin 22 extending

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transversely adjacent one end of the cross-piece 20 and a locking pin 24 connected at the other end of the cross piece 20 by a hinge 26.

One of the uprights 12a is fixed to the base plate 14. The other upright 12b is connected to the base plate 14 by a hinge 28.

- 5 The locking pin 24 slides into the top of the fixed upright 12a. The locating pin 22 is received in the top of the hinged upright 12b.

Each fin 18 is provided with collars 30 on a first face thereof. A fin 18 can slide over an upright 12a, 12b with the upright 12a, 12b being received in the collars 30.

- 10 Each fin 18 is provided with a series of spaced notches 32 along each longitudinal edge thereof. The notches 32a along a first edge of each fin 18 may be spaced apart a first distance whilst the notches 32b along a second edge of each fin 18 may be spaced a second distance.

- 15 Fins 18 may be provided with notches 32 having spacings that match the thicknesses of panels 10 that it is desired to construct using the apparatus 1.

Props 34 are provided to retain the supports 2 in an upright condition. The uprights 12a are provided with holes 36 for locating the props 34. The props 34 have base plates 40.

- 20 The fins 18 are provided with holes 37 for connection of the shuttering 6 with the fins 18 of respective pairs of supports 2.

- Each formwork member 4 comprises a beam of box section having rib-chamfers 38 extending longitudinally therealong at each corner thereof. Such formwork members 4 may be made, for example, from extruded plastics, extruded aluminium or pressed metal. For extra strength, the box section formwork members 4 may be foam-filled.
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The shuttering 6 may be provided as plywood sheets.

The manner of assembly of the apparatus 1 of the present invention will now be described.

5 Fins 18 are selected and placed on the uprights 12a, 12b of a first pair of supports 2 such that the innermost notches 32, i.e. the notches 32 that face each other, have the same spacing; that spacing is equivalent to the required thickness of the panels 10 to be constructed. The support 2 shown in Figures 3 and 4 has fins 18 mounted on the uprights 12a, 12b such that the notches 32a of the respective fins 18 face each other. In contrast, the support 2 shown in Figure 10 5 has fins mounted on the uprights 12a, 12b such that the notches 32b of the respective fins 18 face each other. The spacing between the notches 32a is greater than the spacing between the notches 32b. Thus, using notches 32a produces a panel 10 having a greater thickness than when notches 32b are used.

15 The fins 18 can be installed on the uprights 12a, 12b of each support 2 by removing the top-piece 16 and sliding each fin 18 over a respective upright 12a, 12b. The respective top-piece 16 is then returned to each support 2 such that the locking pin 24 is received into the top of the fixed upright 12a and the locating pin 22 is received into the top of the upright 12b.

20 The supports 2 are arranged in a face-to-face relationship, and spaced apart by a distance approximately equal to the length of the panels 10 to be constructed. The supports 2 are arranged such that the faces of the fins 18 that do not carry the collars 30 face each other.

25 A first formwork member 4 is positioned so that it extends between a pair of supports 2. This is done by pivoting the cross-piece 20 upwardly, in the direction of arrow A shown in Fig. 7, via the hinge 26 such that the locating pin 22 disengages from the upright 12b of each of the supports 2. Each upright 12b is then pivoted away from the uprights 12a by the hinges 28 in the direction of arrow B as shown in Fig. 7. The first formwork member 4 can then be positioned

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between the uprights 12a, 12b of the pair of supports 2. The nb chamfers 38 of the formwork member 4 locate in the notches 32 of the fins 18. The upright 12b of each support 2 is then returned to the vertical position by pivoting it in the direction toward a respective upright 12a as shown by arrow C in figure 7. The cross-piece 16 is then pivoted downwardly in the direction of arrow D as shown in figure 7 such that the locating pin 22 locates in the upper part of the upright 12b of each support 2. The formwork member 4 is then positioned such that it extends between a respective pair of supports 2 adjacent respective base plates 14 thereof.

- 10 A second pair of supports 2 is positioned in a manner similar to that previously herein before described. The second pair of supports 2 is positioned to receive a second formwork member 4 which is positioned substantially parallel to the first formwork member 4. The spacing between the first and second formwork members 4 and respective opposed supports 2 of the first and second pair of
- 15 supports 2 determines the width of the panels 10 to be constructed.

The second formwork member 4 is positioned to extend between the second pair of supports 2 in a manner similar to that hereinbefore described with reference to the first formwork member 4 and first pair of supports 2.

- The first and second pairs of supports 2 are arranged such that the fixed support
- 20 12a of opposed supports 2 are opposed to each other.

Shuttering 6 is then connected between respective uprights 12a of each pair of opposed supports 2. This is done by way of holes 37 in the fins 18 of the supports 2. Fixing screws pass through the holes 37 and shuttering 6 to fix the shuttering 6 to the fins 18 of the supports 2.

- 25 The formwork members 4 and shuttering 6 surround an area 8 for casting a panel.

Once the supports 2, formwork members 4 and shuttering 6 have been correctly positioned for casting the panels 10, the supports 2 may be secured in place by

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passing screws through holes 37 in the base plates 14 and securing to the ground.

The props 34 are then positioned to support the supports 2. Screws may be driven into the ground through holes in base plates 40 of the props 34.

5 The apparatus 1 of the present invention does not have any intermediate support member or barrier between each pair of supports 2 that support a formwork member 4.

By following the above assembly procedure, the apparatus 1 has been assembled in the condition shown in figure 1. The apparatus 1 is then ready to
10 receive the casting of a first panel 10a.

Prior to casting, a release agent or bond breaker is applied to the ground. Reinforcing members (not shown) are placed in position in the space 8. Concrete is then poured into the space 8 substantially up to the height of the edge of the rib-chamfers 38 of the formwork members 4. The concrete is then
15 allowed to settle. A vibrating screed can be used to create a smooth and level upper surface to the concrete pour. Such vibrating screeds are known in the art. The vibrating screed can be provided so that it extends across the concrete pour from one formwork member 4 to the other. Since there are no intermediate support members or other barriers between each pair of supports 2 that support
20 a respective formwork member 4, the vibrating screed can be positioned adjacent one of the shuttering 6 and moved in a continuous motion along the surface of the poured concrete toward the other shuttering 6.

The concrete pour is then allowed to set and cure to form a first panel 10a.

After the first panel 10a has been formed, the formwork members 4 are
25 repositioned for casting the next panel 10b. This is done by first pivoting the cross pieces 16 upwardly in the direction of arrow A shown in figure 7. The uprights 12b are then pivoted away from the uprights 12a in the direction of arrow B shown in figure 7. This permits access to the formwork members 4 so

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that they can be removed from their existing positions and moved upwardly to the next pair of notches 32. The uppermost notches 32 used when casting the first panel 10a become the lowermost notches 32 for casting the second panel 10b. The uprights 12b are returned to their vertical condition and the cross pieces 16 returned to their horizontal position so that the locating pins 22 locate in their respective uprights 12b. This brings notches 32 of both uprights 12a and 12b into engagement with the rib-chamfers 38 of the formwork members 4 such that the formwork members 4 are supported.

A coating of release agent or bond breaker is then applied to the upper surface of the first panel 10a. Concrete is then poured on top of the first panel 10a to form the second panel 10b and any reinforcing material is also placed into position before the concrete is poured. This is done in a manner similar to that for the first panel 10a.

At the conclusion of the formation of successive panels 10, the formwork members 4 are vertically repositioned on the supports 2 for casting subsequent panels 10. Figure 2 shows a condition of the apparatus 1 in which three panels 10a, 10b, 10c have been cast and the formwork members 4 have been repositioned ready for casting of a fourth panel 10 on top of the third panel 10c.

Once the required number of panels 10 has been cast using the apparatus 1, the apparatus 1 is disassembled by removing the formwork members 4, uprights 2 and shuttering 6 to leave a stack of panels 10. The panels 10 may then be lifted using suitable lifting equipment. Due to the use of the release agent or bond breaker, each panel 10 can be readily removed and lifted from the panel 10 beneath it.

The apparatus 1 or the present invention may be used to make pre-cast and tilt-up concrete panels 10 for walls and other applications.

The absence of any support members or barriers between each pair of supports 2 that support a formwork member 4 allows easy access to the vibrating screed

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to traverse the length of the concrete that has been poured for casting each panel 10.

The apparatus 1 provides for ready re-configuration for casting subsequent panels 10 and allows for casting of panels 10 having consistent thicknesses.

5 Modifications and variations such as would be apparent to a skilled addressee are deemed to be within the scope of the present invention.

Throughout the specification, unless the context requires otherwise, the word "comprise" or variations such as "comprises" or "comprising", will be understood to imply the inclusion of a stated integer or group of integers but not the
10 exclusion of any other integer or group of integers.

Dated this thirtieth day of December 2002.

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